

EXPRESS MAIL LABEL NO.: EV 347799799 US	DATE OF DEPOSIT: <u>July 3, 2003</u>
<p>I hereby certify that this paper and fee are being deposited with the United States Postal Service Express Mail Post Office to Addressee service under 37 CFR § 1.10 on the date indicated below and is addressed to Mail Stop Patent Applications, Commissioner for Patents, PO Box 1450, Alexandria, VA 22313-1450.</p>	
<u>Sandra M. Campbell</u> NAME OF PERSON MAILING PAPER AND FEE	<u>Sandra M. Campbell</u> SIGNATURE OF PERSON MAILING PAPER AND FEE

Inventor(s): Michael Mueller
Deborah R. Mueller

STACKER

BACKGROUND OF THE INVENTION

Statement of the Technical Field

[0001] The present invention relates to storage racks, and more particularly to storage devices configured for vertically storing articles of manufacture.

Description of the Related Art

[0002] Stacking devices range from complex shelving units to simple spice racks. Stacking devices universally serve the same purpose--to enhance the storage capacity of a storage container. In the absence of a stacking device, a given storage container can hold only that which it had been intended to hold. Typically, a given storage container can hold only a set of articles of manufacture whose collective surface area does not exceed the surface area of the base of the storage container. Often, however, the volume of the storage container, notwithstanding the surface area of the base, can accommodate a large number of articles, volumetrically, but only a small number of articles in actuality. Stacking devices can increase the base surface area of a storage container to capitalize on excess capacity from the volumetric perspective.

[0003] Presently, most stacking devices which are simple and inexpensive in nature include a stacking surface and support legs designed to elevate the stacking

surface above the top surfaces of those articles of manufacture which are to be placed below the stacking surface. Through this arrangement, the capacity of a storage container can be enhanced, sometimes by double the initial capacity. Still, the use of the prototypical stacking shelf known in the art fails to optimize the amount of storage capacity added to storage container. More particularly, given a fixed collection of stored articles of manufacture, the difference between an optimal amount of added storage capacity and an actual amount of added storage capacity in a given storage container can be attributed to the unused, wasted volume of space between the bottom surface of the stacking surface and the top surfaces of those articles of manufacture which are to be placed below the stacking surface.

[0004] Occasionally, one can stack individual articles of manufacture directly on top one another, as is the case with articles of clothing such as shirts or underwear, home improvement items such as paint canisters and ceramic tiles, and food containers, such as cans of soup, soda cans and tupperware. Still, in many cases, the top surfaces of containers in of themselves cannot support the weight of a stacked article of manufacture. Moreover, often a container lacks a top surface at all, such as in the case of pyrex cookware having mere tin foil or seran wrap as a cover. In those circumstances, it is not possible to stack articles of manufacture one on top of the other.

[0005] Generally, most stacking devices available in the art do not include solid stacking surfaces for any number of reasons. Regardless of the application, to provide a solid stacking surface is to add unnecessary weight and cost in the manufacture of the stacking device. Moreover, in the context of food storage containers, including the conventional refrigerator, the conventional freezer and the conventional cabinet, a solid

stacking surface can accumulate spilt food material and can require, in consequence, undesirable cleaning requirements. Yet, the dimensionality of the ordinary stacking shelf can limit the washability of the stacking shelf in a dishwasher, thus requiring manual cleaning. As a result, most stacking devices include a limited stacking surface, for example a wire mesh.

[0006] Similar concerns are known in the art of permanent shelving where wire shelves are quite common. Because wire shelves have limited surface area in which dust can accumulate, wire shelves have become the gold standard in closet design. Still, for those articles of manufacture which are susceptible to molding and deformation, including articles of clothing, and particularly cotton shirts, the wire frame stacking surface can leave an undesirable wire frame imprint pattern on stacked articles of manufacture. Moreover, the wire frame stacking surface simply remains incapable of supporting small items with stability where the dimensions of the bottom surface of the small items compare directly with the mesh dimensions of the wire frame stacking surface. Nevertheless, the sheer weight and expense of a solid core shelving surface can inhibit the use of solid core shelving in a closet system.

[0007] Thus, it will be clear to the skilled artisan that conventional stacking devices suffer from several inherent deficiencies. Accordingly, the state of the art lacks a simple stacking device with which the storage capacity of a storage container can be maximized given a fixed set of articles of manufacture. Furthermore, the state of the art lacks a simple stacking device configured for ease of washing, especially in a dishwasher. Finally, the state of the art lacks a device for facilitating the vertical

stacking of clothing on wire mesh shelves without incurring the risk of molding and deformation of the clothing vertically stacked on the wire mesh shelving.

SUMMARY OF THE INVENTION

[0008] The present invention is a stacking device and system. A stacking device can include a stacking surface having a configuration for supporting a supported article of manufacture stacked on top of the stacking surface. The stacking device further can include a support surface opposite the stacking surface. The support surface can have a configuration for direct communication with a supporting article of manufacture below the support surface. Notably, the support surface can be a polygon having a surface area which exceeds a surface area of the supporting article of manufacture.

[0009] Alternatively, the support surface can include an ellipse having a diameter which exceeds a diameter of the supporting article of manufacture. Preferably, the stacking surface and the support surface can include a machine washable material. The stacking surface and the support surface further can include a material resistant to the heat experienced in an oven such as a microwave safe plastic or a carbon based heat resistant material. A stacking system can include a multiplicity of stacking devices. In a preferred aspect of the invention, at least two of the stacking devices in the stacking system can have differing surface areas for supporting articles of manufacture of different shapes and sizes.

BRIEF DESCRIPTION OF THE DRAWINGS

[0010] There are shown in the drawings embodiments which are presently preferred, it being understood, however, that the invention is not limited to the precise arrangements and instrumentalities shown, wherein:

[0011] Figure 1A is a schematic illustration of a stacking device which has been configured in accordance with the inventive arrangements;

[0012] Figures 1B and 1C are schematic illustrations of the stacking device of Figure 1A in various size and shape configurations;

[0013] Figure 2 is a pictorial illustration of a stacking system; and,

[0014] Figure 3 is a schematic illustration of a stacking device configured for stacking articles of clothing on a wire mesh shelf.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0015] Figure 1A is a schematic illustration of a stacking device which has been configured in accordance with the inventive arrangements. In accordance with the present invention, a stacking device can include a substantially flat board 100A comprising a rigid construction. The flat board 100A can include a stacking surface 110A and a supporting surface 120A opposite the stacking surface 110A. The flat board 100A can include a low cost disposable material such as reinforced cardboard, or a machine washable material such as metal, including stainless steel or aluminum, plastic, nylon or polypropylene, or a heat resistant material, for example microwave safe plastics, or a coated metal.

[0016] In the preferred embodiment, the stacking device can support stacked articles of manufacture 130A on the stacking surface 110A. More particularly, the stacking device can support the vertical stacking of a single column of one or more articles of manufacture, or the vertical stacking of one or more columns of one or more articles of manufacture. To support the stacked articles of manufacture 130A, the supporting surface 120A can directly communicate with supporting articles of manufacture 140A. In this way, the normal force imposed upon the supporting surface 120A by the supporting articles of manufacture 140A can support the weight of the stacked articles of manufacture 130A which can directly communicate with the stacking surface 110A.

[0017] Figures 1B and 1C are schematic illustrations of the stacking device of Figure 1A in various size and shape configurations. As it will be apparent from the illustrations, preferably the stacking devices 100B, 100C can include a surface area

150B, 150C which exceeds the surface area 160B, 160C of the supporting articles of manufacture 140B, 140C. In this way, the supporting capability of the stacking surface of the stacking devices 100B, 100C can be enhanced to support articles of manufacture having a surface area which exceeds that of the supporting articles of manufacture 140B, 140C. Importantly, as it will be recognized by the skilled artisan, the shapes and dimensions of the stacking devices 100B, 100C can vary widely. In this regard, where the shape of the stacking device 100C is elliptical as is the case shown in Figure 3C, preferably the diameter of the stacking device 100C will exceed that of the supporting article of manufacture 140C.

[0018] Figure 2 is a pictorial illustration of a stacking system. In a stacking system which has been configured in accordance with the inventive arrangements, a multiplicity of stacking devices 210, 220, 230 can be bundled together in a marketable arrangement 200. In this arrangement 200, an end consumer can purchase a single package having enough stacking devices 210, 220, 230 of a variety of shapes and sizes so as to be able to efficiently utilize the volumetric capacity of a storage container, such as a refrigerator or freezer. Additionally, the arrangement 200 of stacking devices 210, 220, 230 can include a variety of colors for asthetic purposes.

[0019] As it will be noted by the skilled artisan, the stacking device of the present invention can be adapted for use with wire mesh shelving so as to remediate the well-known problem of the deformation of clothing stacked on a wire mesh shelf. In this regard, Figure 3 is a schematic illustration of a stacking device configured for stacking articles of clothing on a wire mesh shelf. In this preferred configuration, a stacking device 300 can be disposed between one or more articles of clothing 340 and a wire

mesh shelf 330. In this way, the supporting surface 320 of the stacking device can directly communicate with the wire mesh shelf 330, which the flat stacking surface 310 of the stacking device can directly communicate with the articles of clothing 340. In this way, the physical support of the wire mesh shelf 330 can be combined with the non-wire, substantially flat stacking surface 310 of the stacking device 300 to support the stacking of clothing without risking the wrinkling or deformation of the clothing.

[0020] While the foregoing specification illustrates and describes the preferred embodiments of this invention, it is to be understood that the invention is not limited to the precise construction herein disclosed. The invention can be embodied in other specific forms without departing from the spirit or essential attributes. Accordingly, reference should be made to the following claims, rather than to the foregoing specification, as indicating the scope of the invention.